



2010 Adult Immunization Update

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Adolescent, and Adult
Immunization Coalitions'**
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Disclosures



No financial conflict or interest with the manufacturer of any product named during this course.

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Disclosures



I will not discuss vaccine
recommendations in an
off-label manner

I will not discuss
unlicensed vaccines

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Objectives



After this presentation the learner will

1. Schedule the routinely recommended vaccines for their patient population
2. Share the most recent ACIP recommendations with their colleagues

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Overview



2010 Adult Schedule

Pneumococcal polysaccharide vaccine
recommendations

Meningococcal vaccine recommendations

MMR Criteria of Immunity

Zoster vaccine (Zos)

Health reform and adult vaccination

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Recommended Adult Immunization Schedule


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Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.


Figure 1. Recommended adult immunization schedule, by vaccine and age group

VACCINE ▼	AGE GROUP▶	19–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,*}		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs				Td booster every 10 yrs
Human papillomavirus (HPV) ^{2,*}		3 doses (females)				
Varicella ^{3,*}		2 doses				
Zoster ⁴					1 dose	
Measles, mumps, rubella (MMR) ^{5,*}		1 or 2 doses		1 dose		
Influenza ^{6,*}		1 dose annually				
Pneumococcal (polysaccharide) ^{7,8}		1 or 2 doses				1 dose
Hepatitis A ^{9,*}		2 doses				
Hepatitis B ^{10,*}		3 doses				
Meningococcal ^{11,*}		1 or more doses				

*Covered by the Vaccine Injury Compensation Program.

 For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

 Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

 No recommendation

Recommended Adult Immunization Schedule

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Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 2. Vaccines that might be indicated for adults based on medical and other indications

INDICATION ▼	Pregnancy	Immu- compromising conditions (excluding human immunodeficiency virus [HIV]) ^{9-5,13}	HIV infection ^{9-5,12,13} CD4+ T lympho- cyte count <200 cells/μL ≥200 cells/μL	Diabetes, heart disease, chronic lung disease, chronic alcoholism	Asplenia ¹² (including elective splenectomy and persistent complement component deficiencies)	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemodialysis	Health-care personnel
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,*}	Td	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs						
Human papillomavirus (HPV) ^{2,*}		3 doses for females through age 26 yrs						
Varicella ^{3,*}	Contraindicated	2 doses						
Zoster ⁴	Contraindicated	1 dose						
Measles, mumps, rubella (MMR) ^{5,*}	Contraindicated	1 or 2 doses						
Influenza ^{6,*}	1 dose TIV annually							1 dose TIV or LAIV annually
Pneumococcal (polysaccharide) ^{7,8}	1 or 2 doses							
Hepatitis A ^{9,*}	2 doses							
Hepatitis B ^{10,*}	3 doses							
Meningococcal ^{11,*}	1 or more doses							

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No recommendation



Streptococcus pneumoniae

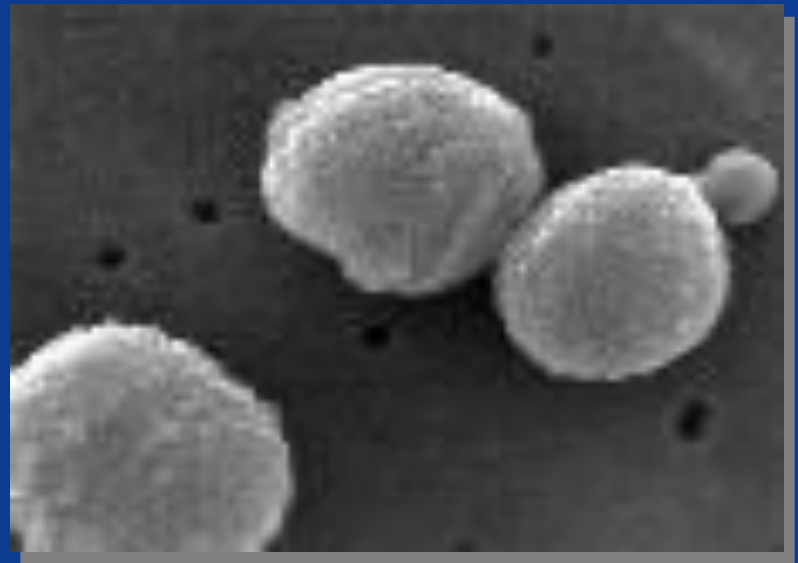


Gram-positive
bacteria

90 known
serotypes

Polysaccharide
capsule important
virulence factor

Type-specific
antibody is
protective



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Pneumococcal Disease



Second most common
cause of vaccine-
preventable death in the
U.S. (after influenza)

Major clinical syndromes
include pneumonia,
bacteremia, and
meningitis

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Pneumococcal Polysaccharide Vaccine



Not effective in children younger
than 2 years

60%-70% against invasive
disease

Less effective in preventing
pneumococcal pneumonia

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Pneumococcal Polysaccharide Vaccine (PPSV) Recommendations



Adults 65 years and older

Persons 19 years and older with asthma

Persons 19 years and older who are
current cigarette smokers

Persons 2 years and older with
chronic illness

anatomic or functional asplenia

immunocompromised (disease,
chemotherapy, steroids)

HIV infection

environments or settings with increased
risk

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Risk of pneumococcal disease among persons with asthma



Table 2. Association between the Presence of Asthma and the Risk of Invasive Pneumococcal Disease.

Variable	Case Subjects (N=635)	Controls (N=6350)	Adjusted Odds Ratio for Invasive Pneumococcal Disease (95% CI)*
	no./total no. (%)	no./total no. (%)	
Any asthma	114/635 (18.0)	516/6350 (8.1)	2.4 (1.9–3.1)
High-risk asthma	95/635 (15.0)	383/6350 (6.0)	2.6 (2.0–3.5)
Low-risk asthma	19/635 (3.0)	133/6350 (2.1)	1.7 (0.99–3.0)

Asthma is an independent risk-factor for invasive pneumococcal disease

The risk among persons with asthma was at least double that among controls.

1. Talbot et al. N Engl J Med 2005; 352(20): 2082-90

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ACIP recommendations for use of PPSV23, October 2008



- Asthma is an independent risk factor for invasive pneumococcal disease.
- The ACIP recommends that asthma should be included among the chronic pulmonary diseases (such as COPD and emphysema) that are indications for PPSV23 in adults aged 19 through 64 years.
- Wording of the revised recommendation: *“Persons aged 19 through 64 years who have asthma should receive a single dose of PPSV23.”*

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Why are persons with asthma at increased risk for pneumococcal disease?



- Persons with asthma may have
 - disrupted physical barrier of the airway lining
 - increased mucous production
 - alterations in immune response
- Asthma medications (corticosteroids) may suppress the immune system

Hartert T. J Allergy Clin Immunol 2008

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Association of cigarette smoking and IPD



TABLE 4. INDEPENDENT RISK FACTORS FOR INVASIVE PNEUMOCOCCAL DISEASE AMONG IMMUNOCOMPETENT ADULTS 18 TO 64 YEARS OLD.

VARIABLE	ODDS RATIO (95% CI)*	P VALUE
Smoking status		
Current smoker	4.1 (2.4–7.3)	<0.001
Former smoker	1.1 (0.5–2.2)	0.91
Passive exposure to smoke	2.5 (1.2–5.1)	0.01
Never smoked and no passive exposure to smoke	1.0	

Strongest independent risk-factor in immunocompetent, non-elderly adults¹

- Adjusted population attributable risk: 51%
- Dose response relations

Association also subsequently confirmed in immunocompromised groups^{2,3}

1. Nuorti et al. N Engl J Med 2000;342:681-9

2.3. Breiman Arch Int Med 2000, Grau Arch Int Med 2005

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Why are cigarette smokers at increased risk of IPD?



- Cigarette smoke
 - impairs mucociliary clearance in the respiratory tract
 - disrupts respiratory epithelium
 - enhances bacterial attachment
- Smokers may have
 - more frequent (viral) respiratory infections
 - higher rates of pneumococcal colonization
 - lower immunoglobulin levels?

Nuorti et al. N Engl J Med 2000;342:681-9

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Pneumococcal Polysaccharide Vaccine Revaccination



Routine revaccination of immuno-competent persons is not recommended

Revaccination recommended for persons 2 years of age or older who are at highest risk of serious pneumococcal infection

Single revaccination dose at least 5 years after the first dose

MMWR 1997;46(RR-8):1-24

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Pneumococcal Polysaccharide Vaccine Candidates for Revaccination



Persons ≥ 2 years of age
with:

- functional or anatomic asplenia
- immunosuppression
- transplant
- chronic renal failure
- nephrotic syndrome

Persons vaccinated at < 65
years of age

MMWR 1997;46(RR-8):1-24

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Meningococcal Disease

Clinical Features

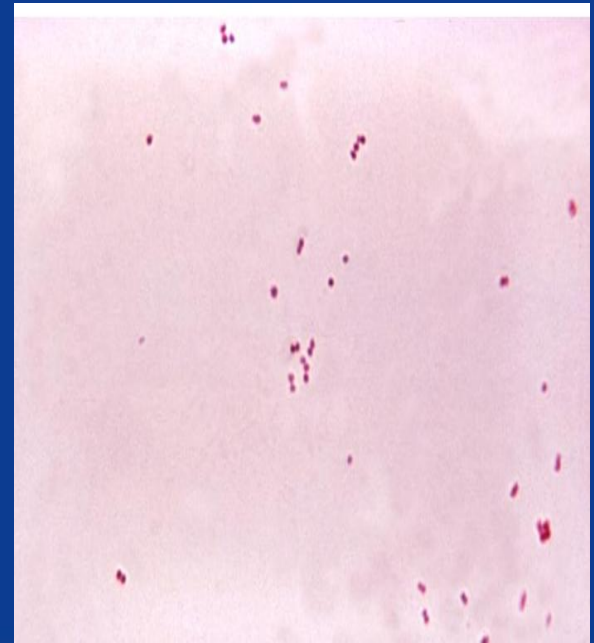


Incubation period 3-4 days
(range 2-10 days)

Meningitis: Abrupt onset of
fever, meningeal
symptoms,

Meningococcemia:
bloodstream infection,
fever, rash, hypotension,
organ failure

Fatality rate 9%-12%; up
to 40% in
meningococcemia



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Meningococcal Disease

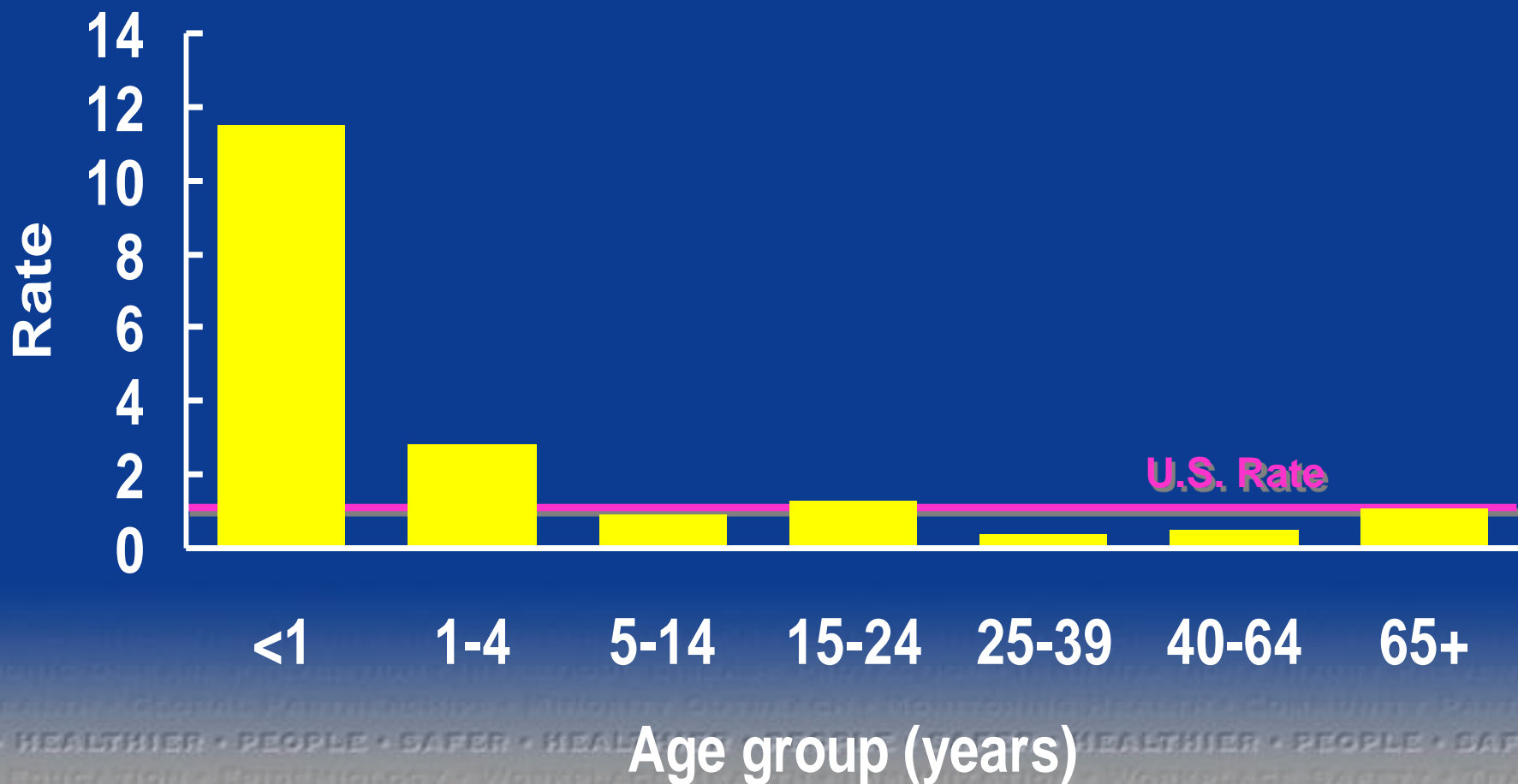


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N Engl J Med. 2001;344:1372



Meningococcal Disease, 1998 Incidence by Age Group



Rate per 100,000 population

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Meningococcal Vaccine Recommendations (2007)

Routinely recommended for:

- All children at 11-18 years of age
- All college freshmen living in a dormitory
- Other persons 2 through 55 years of age at increased risk of invasive meningococcal disease

MMWR 2007;56(No. 31):794-5.

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Meningococcal Vaccine Recommendations



Recommended for persons at increased risk of meningococcal disease:

- Microbiologists who are routinely exposed to isolates of *N. meningitidis*(isolates)
- Military recruits
- Persons who travel to and U.S. citizens who reside in countries in which *N. meningitidis* is hyperendemic or epidemic
- Persistent complement component deficiency
- functional or anatomic asplenia

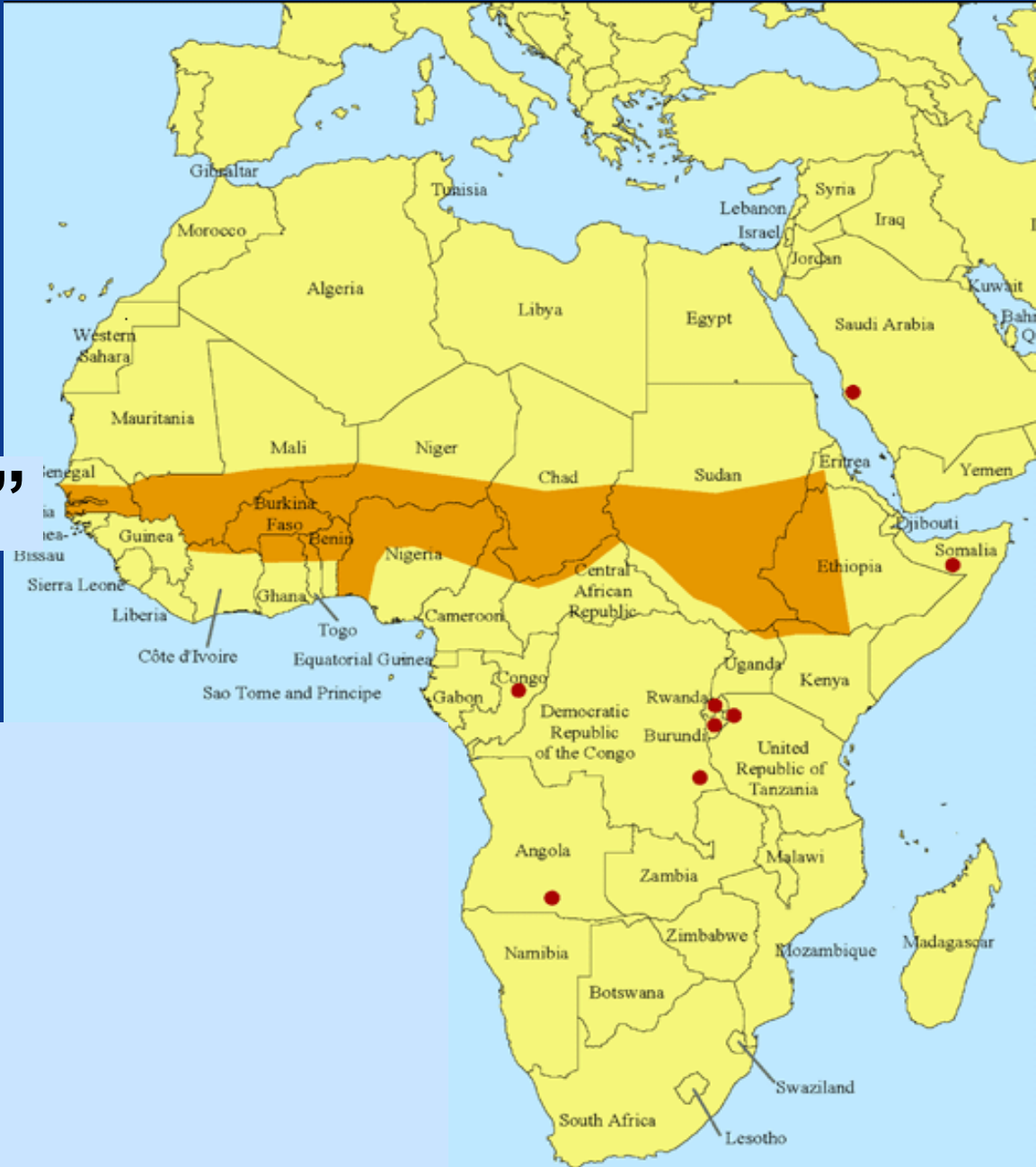
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MMWR 2005; 54(RR-7);1-21

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“Meningitis Belt”





Meningococcal Conjugate Vaccine (MCV)



Menactra® (sanofi pasteur)

Quadrivalent polysaccharide vaccine (A, C, Y, W-135)

conjugated to diphtheria toxoid

Administered by intramuscular injection

Single dose vials do not contain a preservative

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Meningococcal Conjugate Vaccine (Menactra)



Approved only for persons 2 through 55 years of age

Persons 56 years and older at increased risk should receive the meningococcal POLYSACCHARIDE vaccine

Meningococcal vaccine is not routinely recommended for persons 2-10 years of age who are not in a high risk group

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New Meningococcal Conjugate Vaccine



Licensed by Novartis: Menveo
Approved 11 through 55 years
No preference between Menveo or
Menactra (but only Menactra can
be given 2-10 years of age)

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MCV Revaccination Recommendations



Persons who remain at risk for meningococcal meningitis should receive a revaccination dose at a five year interval

Children through age 18 years who received their first dose of MCV or MPSV at ages 2 through 6 years and remain at increased risk for meningococcal disease should receive an additional dose of MCV (Menactra) 3 years after their first dose

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MCV Revaccination Recommendations

High-risk persons who should be revaccinated with MCV:

- persistent complement component deficiency
- anatomic or functional asplenia
- frequent travelers to or persons living in areas with high rates of meningococcal disease

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MCV Revaccination Recommendations



MCV revaccination
recommendation does NOT
apply to children whose
only risk factor is living in
on-campus housing

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Measles-Mumps-Rubella Vaccine



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Measles-Mumps-Rubella Vaccine



At least one dose
recommended routinely
for susceptible adults
born after 1956

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Measles/Mumps Criteria of Immunity



Birth before 1957

Laboratory evidence of immunity (disease or vaccination)

Documentation of vaccination

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Rubella Criteria of Immunity



Birth before 1957*

Laboratory evidence of
immunity (disease or
vaccination)

Documentation of vaccination

* Males only

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Measles-Mumps-Rubella Vaccine



A second dose recommended
for

- Health-care providers
- International travelers
- Persons who may have received inactivated vaccine (vaccinated between 1963-1967)
- Secondary-school students

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MMR and Health-care Providers



Susceptible health-care providers born before 1957 should receive MMR if there is an outbreak of measles, mumps, or rubella in the health-care facility

Vaccination should be considered regardless of an outbreak

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Single Antigen MMR



As of 2009 Merck no longer produces single antigen measles, mumps or rubella vaccine for distribution

Only MMR is available

Unknown if single antigen products will be available in the future

MMRV expected to be available later in 2009

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Measles Vaccine and Autism



Association first hypothesized* in 1998 by Andrew Wakefield, a British gastroenterologist

Parents noticed that symptoms of autism often followed administration of MMR by days, weeks, or months

Multiple population-based studies have not found an association

***Wakefield advocated either not giving measles vaccine at all or giving the vaccines as separate shots rather than combined MMR**

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Vaccines and Autism



On May 18, 2004, the Institute of Medicine released the findings of its 8th and final vaccine safety review

Evidence favors rejection of an association between either thimerosal or MMR vaccine and autism spectrum disorder

Research funds should be focused on genetic and environmental causes

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Studies of Autism and MMR Vaccine

Taylor, B., et al. Autism and measles, mumps, and rubella vaccine: no epidemiologic evidence for a causal association. *Lancet* 351:2026-2029, 1999.

Kaye JA, et al. Measles, mumps, and rubella vaccine and incidence of autism recorded by general practitioners: a time-trend analysis. *Brit Med J* 322:460-463, 2001.

Madsen KM, et al. A population-based study of measles, mumps, and rubella vaccination and autism. *N Engl J Med*. 2002;347:1477-1482.

*partial listing of representative studies

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Shingles (Herpes Zoster)



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Zoster



Generally associated with normal aging and with anything that causes reduced immunocompetence

Lifetime risk of 30% in the United States

Estimated 500,000- 1 million cases of zoster diagnosed annually in the U.S

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Zoster: Complications

Post-herpetic neuralgia

Pain that lasts after rash clears,
sometime up to a year

Occurs in 20 percent of shingles cases

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Herpes Zoster Vaccine Trial



36,716 persons 60+ years of age
followed for 3 years after vaccination

Efficacy –

51.3% fewer episodes of HZ

Less severe illnesses

66.5% less postherpetic neuralgia

No significant safety issues identified

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Zoster Vaccine



Zostavax by Merck

Licensed May 2006

Live attenuated vaccine

Indicated for prevention of zoster and
post-herpetic neuralgia

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Zoster Vaccine



Indicated for persons 60 years old and older

Indicated for persons with current varicella immunity based on disease

Indicated regardless of a history of zoster

One dose, 0.6 cc subcutaneous injection

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Health-care Reform and Adult Vaccination



HR3590 – Patient Protection and Affordable Care Act

Authorizes the purchase of vaccines recommended for adults

Provides grants to states for adult vaccination

Evaluation of Medicare Part D

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Thank You



Hotline:
800.CDC.INFO

Email:
nipinfo@cdc.gov

Website:
www.cdc.gov/vaccines



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